

## Prob. 1

The values for the feature extraction parameters are as follows:

```
fs = 16000
w = 'Mtaedz'; % M (hamming), t (triangle mel-filters), a (magnitudes), e (log energy), d (deltas), z (magnitudes)
nc = 13; % number of MFCCs excluding 0'th coefficient (log energy, 13 MFCCs, delta log energy, 13 delta log energy)
p = 40; % number of filters in filterbank
n = round(0.030*fs); % frame length
inc = round(0.015*fs); % frame increment
```

## Prob. 2

(a) GMM parameters are as follows:

```
mu =
```

```
Sigma =
```

```
weight =
```

These are close to the reference parameters ( $\mu = [0;4]$ ,  $\text{Sigma} = [1;2]$ , and  $\text{weight} = 1$ ).

(b) GMM parameters are as follows:

```
mu =
```

```
0.0300    3.9517
```

```
Sigma =
```

```
0.9862    0
0    2.1971
```

```
weight =
```

```
1
```

These are close to the reference parameters ( $\mu = [0 \ 4]$ ,  $\text{Sigma} = [1 \ 2]$ , and  $\text{weight} = 1$ ).

## Prob. 5

Equal Error Rate (EER) = 0.0%; decision threshold,  $\theta = 179.8189$ .

Using the above value of  $\theta$ , we have zero false rejections and zero false acceptances.